

CLAIMS

1. Process for the valorisation of metal values in a Zn-, Fe- and Pb-
5 bearing residue, comprising the steps of:
- subjecting the residue to a direct reduction step, thereby
producing a metallic Fe-bearing phase and Zn- and Pb-bearing first
fumes;
- extracting the Zn- and Pb-bearing first fumes and valorising Zn and
10 Pb;
- subjecting the metallic Fe-bearing phase to an oxidising smelting
step, thereby producing an Fe-bearing slag and second metals-bearing
fumes;
- extracting the second metals-bearing fumes and valorising at least
15 part of their metallic content.
2. Process according to claim 1, whereby in the direct reduction
step, a metallic Fe-bearing phase containing at least 50%, and
preferably at least 90% of the Fe contained in the Zn-, Fe- and Pb-
20 bearing residue is obtained.
3. Process according to claims 1 or 2, characterised in that during
the oxidising step, Fe in the metallic Fe-bearing phase is oxidised
to mainly FeO in the slag.
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4. Process according to claim 3, whereby in the oxidising smelting
step, at least 50%, and preferably at least 90% of the Fe in the
metallic Fe-bearing phase is oxidised to FeO.
- 30 5. Process according to any one of claims 1 to 4, wherein the Zn-,
Fe- and Pb-bearing residue is a neutral leach residue or a weak acid
leach residue.
6. Process according to claims 3 or 4, characterised in that an
35 acidic flux and preferably, a mixture of an acidic and a basic flux
are present in the oxidising smelting step.
7. Process according to any one of claims 1 to 6, characterised in
that the Zn-, Fe- and Pb-bearing residue contains Cu and Ag, and
40 that, during the oxidising smelting step, a separate Cu-alloy phase
is produced containing a major part of the Cu and Ag.

8. Process according to any one of claims 1 to 7, characterised in that the Zn-, Fe- and Pb-bearing residue contains Ge, and that, after the direct reduction step, the fraction of the Ge present in the first fumes is separated and forwarded to the oxidising smelting
5 step.

9. Process according to claim 8, whereby the separation of Ge is performed by co-precipitation with Fe hydroxide or by addition of tannic acid.
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10. Process according to any one of claims 1 to 9, whereby the first fumes are oxidised in the reactor used for the direct reduction step.

11. Process according to any one of claims 1 to 10, whereby the reactor used for the direct reduction step is a multiple hearth
15 furnace.

12. Process according to any one of claims 1 to 11, whereby the reactor used for the oxidising smelting step is a submerged lance
20 furnace.